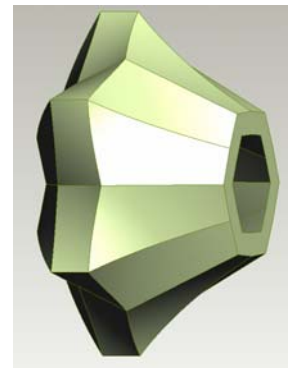
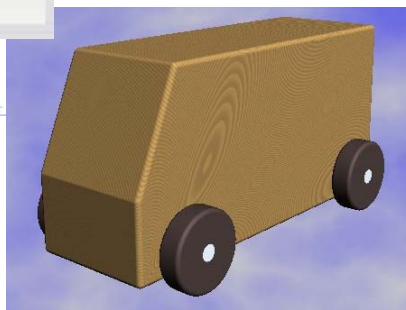
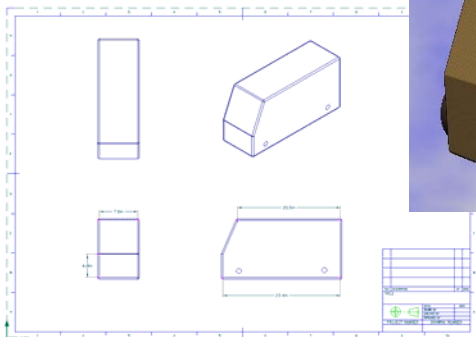
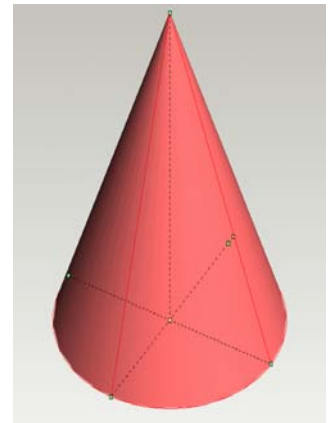
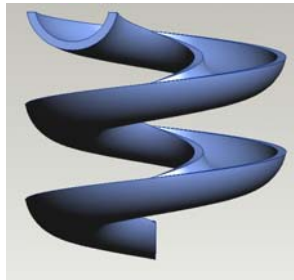
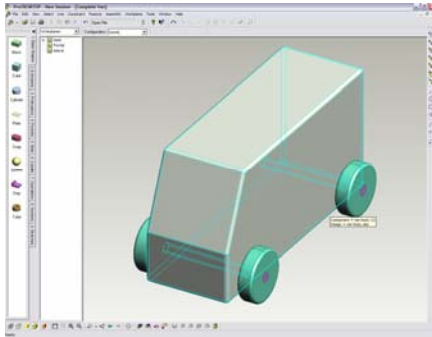


3-D Solid Modeling and Design

Student Learning Activities
for
PTC

Activity #6

Pro/DESKTOP® 8.0



Activity 6:

“Lights, Camera, Action!”

(Flesch-Kincaid readability level = 6.7)

About the program

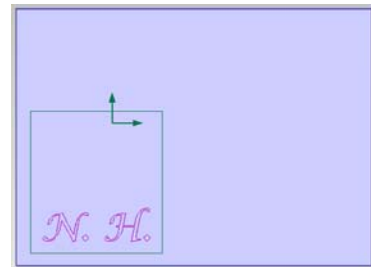
Pro/Desktop (called ‘PD’ from now on) is a powerful software program that allows you to sketch ideas first, and then work on design details later.

This activity will help you:

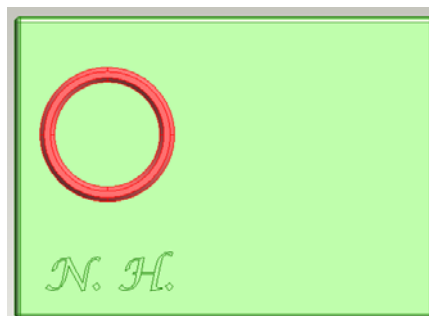
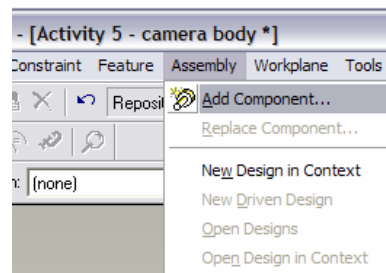
- Assemble your designs from Activity 5
- Dimension the finished product
- Create an engineering drawing of your product

Assembly

Open your **Camera Body** design from Activity #5. Switch to the Workplane view and reposition the axis to the approximate location here→.

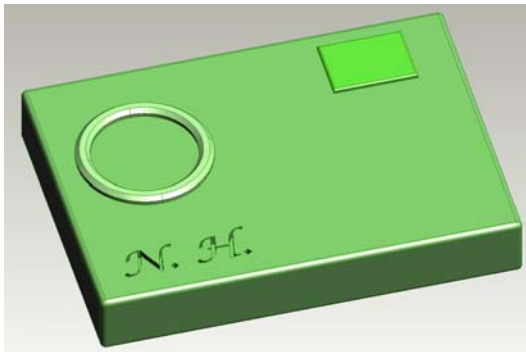
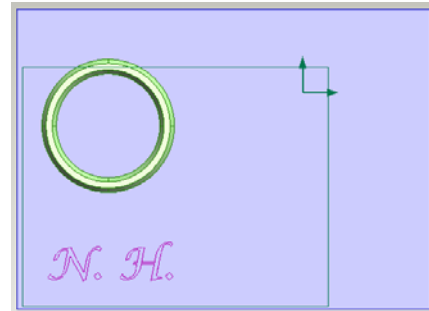


Now, click on the “Assembly” pull-down menu in the Top Toolbar and click on “Add Component”. Select your “Lens Ring” design you saved in Activity #5. If you remember, the Point of Origin for the lens ring was the center of it. When you “assemble” or add a new design to the camera body, it will line up the point of origin of both designs. Cool!



Now, reposition the axis on the camera body to about here→.

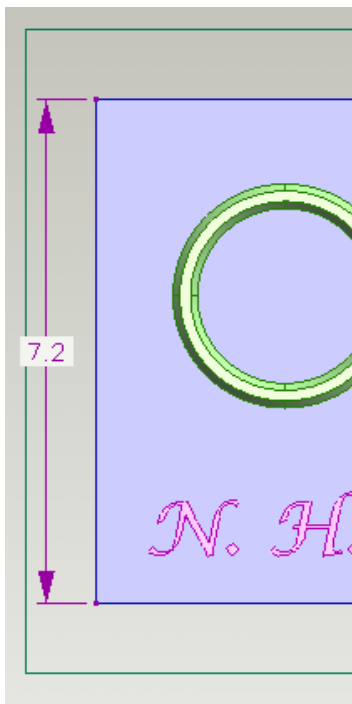
Now add the Flash file from Activity #5. The Point of Origin for that was the lower left-hand corner of the design, so that is what will align to the new camera body Point of Origin.



Rotate the design and look at your new design from different angles.


SAVE your design as **My Camera**.

Dimensioning

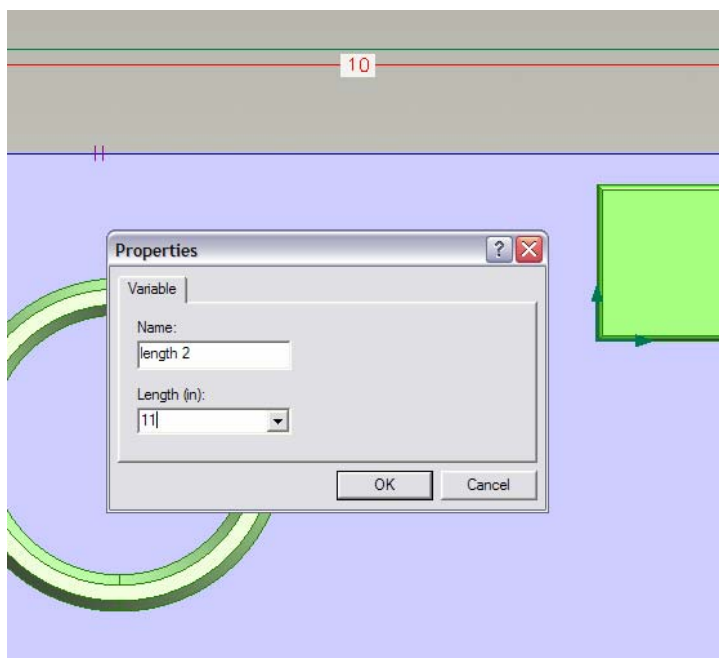
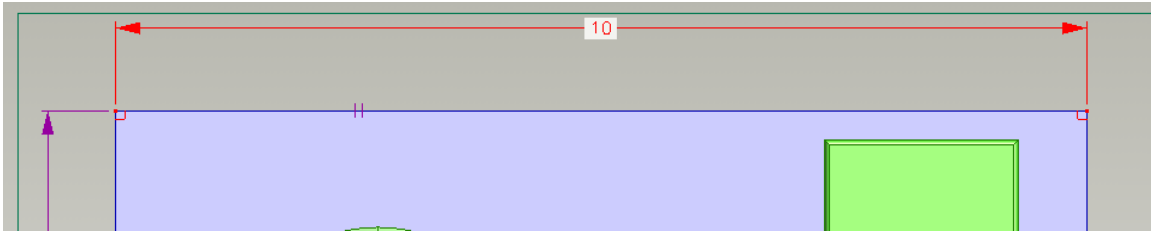


Suppose you wanted to send your design to a product developer or a manufacturer to actually manufacture it. They would need to know how large or small the item is and from what material it should be made. They may even need to print out a copy of the design. PD allows you to add any and all this important information to a sketch or design.

Click on the + by the 'base' workplane in the Object Browser Pane. Double-click on the 'initial' sketch in that workplane to make the sketch active for editing.

Go to the workplane view. Click on the 'Dimension' icon () in the Standard Toolbar. Now, come down to the left side of your camera. **Click and hold** on the left side of the sketch and drag outward just a bit, then let go.

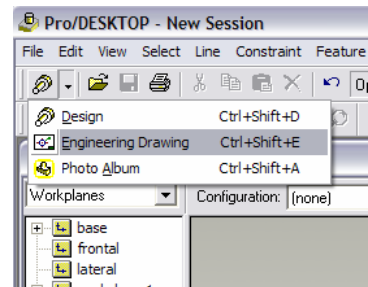
Dimension lines with the length of this side of the camera appear. Dimension lines can be erased easily. Just click on it twice and when active (red), press the **Delete** key. Dimension the top edge of the camera, too.



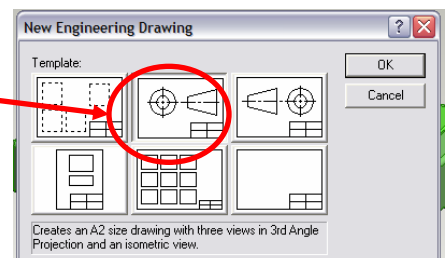
Let's say that you want to make the camera just a little longer than 10". Double-click on the number "10" in the dimension line. In the dialogue box that appears, enter the new length of "11" and click the Update (🚦) icon. Using dimensions, you can change the actual size of the design. Rotate your design and look at the new size. Return to the workplane view.

SAVE your design according to your instructor's directions.

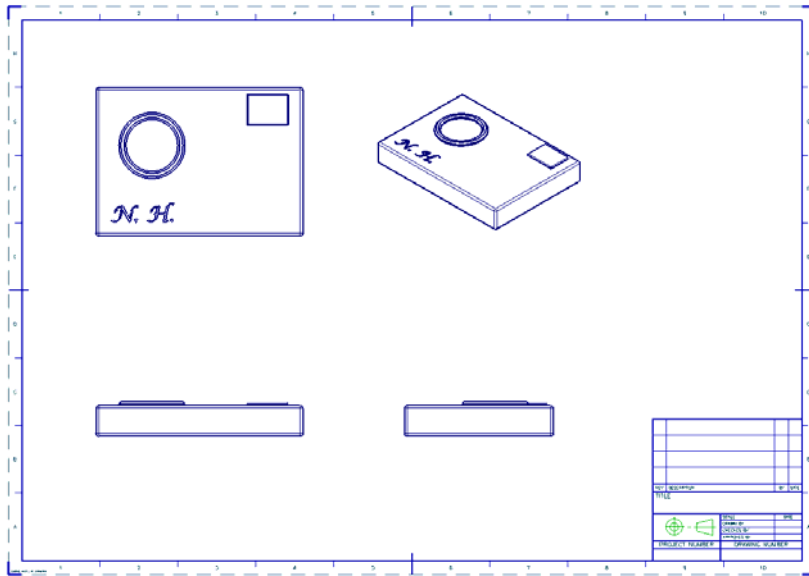
Click on the **scroll-down arrow** next to the New Design icon  in the Top Toolbar. Select 'Engineering Drawing'.



There are several different formats of engineering drawings to choose from, but let's pick the middle top design. This design, if printed would be an A2 size drawing (24.4" x 16.5") with 3 views and an isometric view. Click OK. PD



allows you to customize your paper to any size you like. PD automatically generates a multi-view sketch of your design in the format we chose.

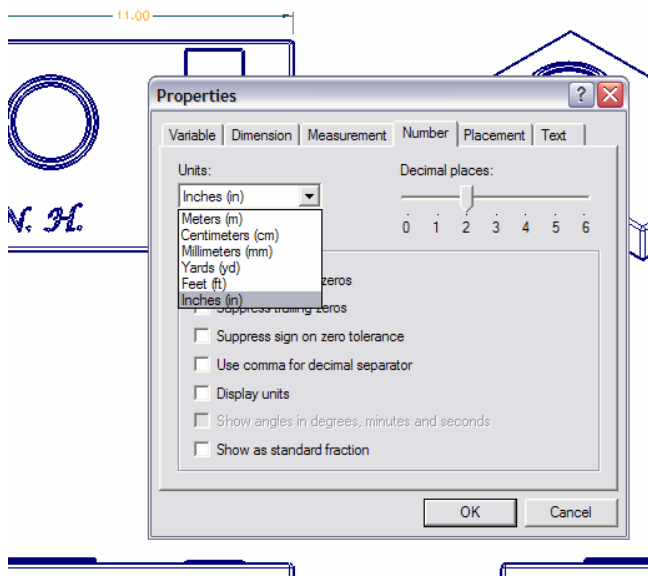
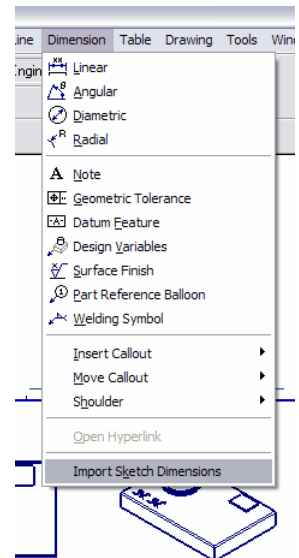


SAVE your drawing according to your instructor's directions.

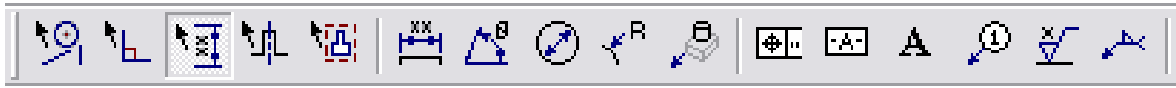
Where did your dimensions go? If you want the drawing to show the dimensions you added to your design, you can simply go to the Top Toolbar, click on the 'Dimension' pull-down menu, and then click on 'Import Sketch Dimensions'. Your dimensions now show.


If they happen to show in differing units (millimeters, for example) than what you entered, you can simply change them to what you want by double-clicking on the number you want to change. A dialogue box appears.

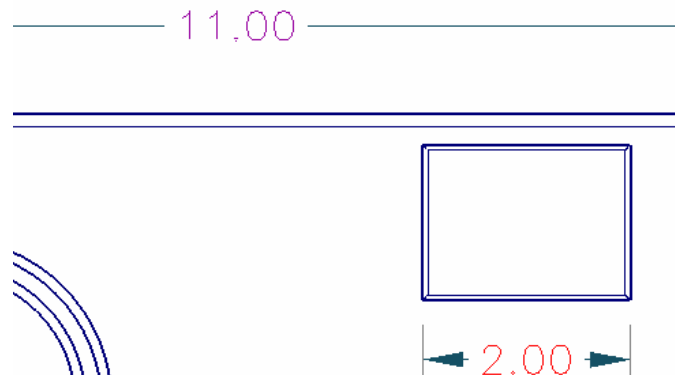
Under the tab 'Number', change the ← 'Units' to what you want. This is handy if an engineer needs to change from inches to millimeters, or feet, etc.



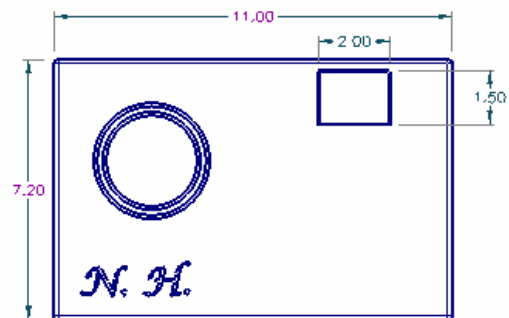
While you are in the engineering drawing, notice that the Dimensioning Toolbar now appears. We will not take time to go into all the icons, but we will explore a few more:



In your engineering drawing of your camera, zoom a window around the flash so that you can see it very closely. Click the Linear Dimension icon () in the Dimensioning Toolbar and then click the left **outer** edge of the flash. **Click and hold** on the right **outer** edge. While holding, drag downward and your dimension lines will appear.

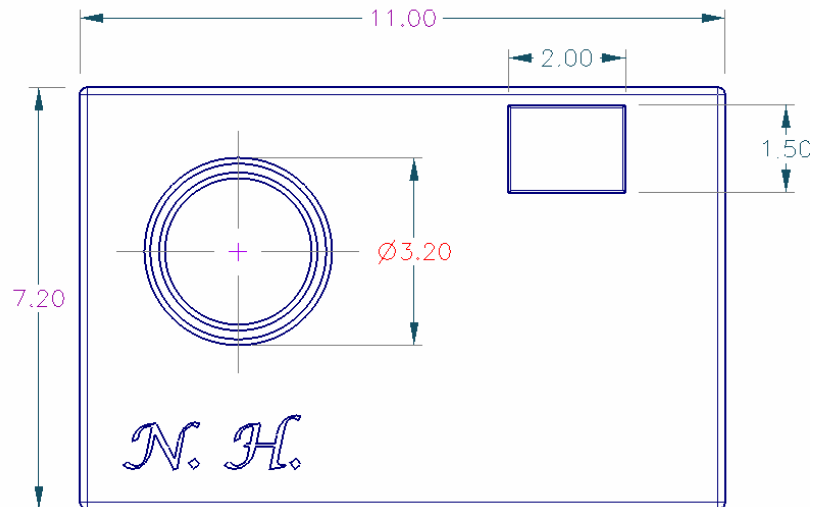


To move dimension lines, simply click once on an arrow of the one you want to move. When it is active (**red**), **Click and hold** while you drag the dimension line to its new location. Try not to cross existing dimension lines if at all possible. Also, try to keep as many dimensions as possible off of the part itself. Continue to dimension the height of the flash, the thickness of the camera body, and the thickness of the lens ring. Something like this is preferred:

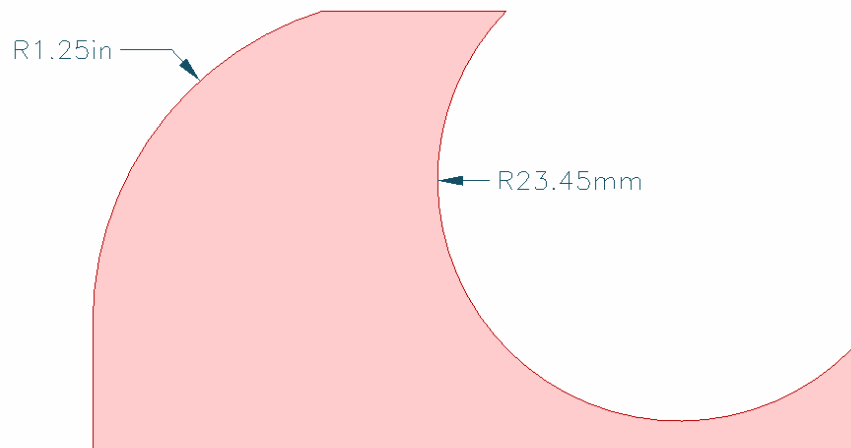


One problem still exists: We have been dimensioning in straight or **linear** lines. How do I know a diameter or a radius of an arc or circle? Our camera has a lens ring and we need to communicate its size.

To do this, click on the Diametric Dimension icon (⌀). **Click and hold** on the right side of the **outer ring** of the lens. Drag and drop to the right. PD figures the size, draws extension lines from the tangent edges of the lens ring, places a center line in the center of the concentric circles, and shows the diameter (Ø) of the ring. In this case, we will leave this dimension close to the circle as it will be the most understandable there. **SAVE** your drawing according to your instructor's directions.



Another frequently used dimensioning icon is the Radial Diametric icon (R) which can be used to dimension an inside or an outside radius as shown here:



Last of all, you need to enter your personal information in on the drawing. In the lower right corner is the **Title Block**. The title block holds information about by whom and when the drawing was made. It includes the name of the drawing and maybe some special notes for whomever will read the printout.

Zoom in on the title block.

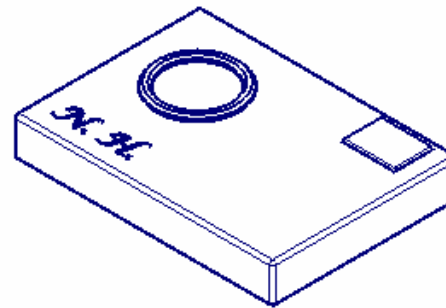
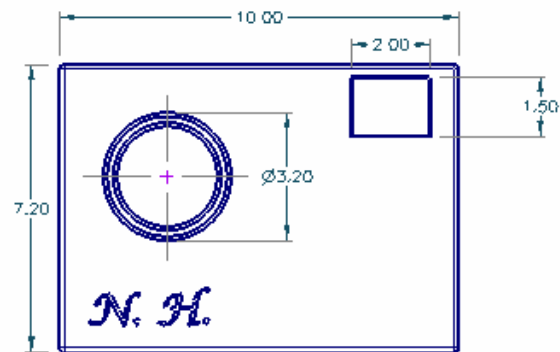
Hold down the SHIFT key and click on the Text Note icon (**A**). While holding shift, move the cursor to the top box in the title block. Click near the center of the box and drag sideways a little. A construction box will follow your cursor around. Move to the left side of the first box in the title block and let go. The word '**Note**' will appear in red. Double-click on this word and in the dialogue box that appears, type your first and last name. Click OK.

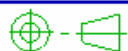
Continue to enter your class period, grade, and drawing name 'Camera' in the remaining lines.

Autoscale to the full view of your drawing and **SAVE** your drawing according to your instructor's directions.

The sample on the next page provides the final drawing.

You have completed this activity using PD! Please exit the program.



Mr. Hancey			
Period 4			
Grade 9			
REV	DESCRIPTION	BY	DATE
TITLE Camera			
		SCALE	DATE
		DRAWN BY	
		CHECKED BY	
PROJECT NUMBER		DRAWING NUMBER	